

**Notice of Allowability**

Application No.

09/981,842

Examiner

B. William Baumeister

Applicant(s)

IMANISHI, KENJI

Art Unit

2815

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 9/10/04.
2. ☒ The allowed claim(s) is/are 1,3-10,12-15 and 21.
3. ☒ The drawings filed on 19 October 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

Art Unit: 2815

## DETAILED ACTION

### *Examiner's Amendment*

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for most of this examiner's amendments was given in a telephone interview with Mr. Michael Caridi on November 26, 2004. After the interview, in the course of preparing the allowance paperwork, the Examiner noticed the following clerical error: all of claim 11 was incorporated into parent claim 10, rendering claim 11 to now be subject to a 112-4<sup>th</sup> paragraph rejection for failure to further limit the parent claim. Whereas the intent to incorporate this limitation into claim 10 is clear, and whereas this clarity of intent outweighs unnecessary delay to applicant that would result from contacting the attorney on this matter, the Examiner finds that administrative efficiency and customer service warrant the canceling of claim 11 by Examiner's Amendment as well.

In the claims:

#### **Claim 1, in the last limitation:**

“...wherein said first and second channel layers are formed to have a thickness small enough to have discrete quantum levels, a first quantum level with the lowest energy level being formed only in the first channel layer, and a second quantum level with the second lowest energy level being formed in both the first and second channel layers.”

Art Unit: 2815

**Claim 10, in the last limitation:**

“...wherein said first and second channel layers are formed to have a thickness small enough to have discrete quantum levels, a first quantum level with the lowest energy level being formed only in the first channel layer, and a second quantum level with the second lowest energy level being formed in both the first and second channel layers.”

**Cancel Claim 11.**

**Claim 12, in the last limitation:**

“...wherein said first and second channel layers are formed to have a thickness small enough to have discrete quantum levels, a first quantum level with the lowest energy level being formed only in the first channel layer, and a second quantum level with the second lowest energy level being formed in both the first and second channel layers.”

**Claim 21, in the last limitation:**

“...wherein said first and second channel layers are formed to have a thickness small enough to have discrete quantum levels, a first quantum level with the lowest energy level being formed only in the first channel layer, and a second quantum level with the second lowest energy level being formed in both the first and second channel layers.”

***Election/Restrictions***

2. Claim 1 is generic and allowable. Accordingly, the restriction requirement as to the encompassed species is hereby withdrawn and claims 4 and 13-15, directed to the species of a HEMT having a second channel with a III-AsSb-based composition is no longer withdrawn from consideration since all of the claims to this species depend from or otherwise include each of the limitations of an allowed generic claim.

3. In view of the above noted withdrawal of the restriction requirement as to the linked species, applicant(s) are advised that if any claim(s) depending from or including all the limitations of the allowable generic linking claim(s) be presented in a continuation or divisional application, such claims may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

***Allowable Subject Matter***

4. Claims 1, 3-10, 12-15 and 21 are allowed.

5. The following is an examiner's statement of reasons for allowance: JP '898 and it's US counterpart Onda '211 teach the general concept of having a two-channel layer HEMT having two channels wherein only higher-energy carriers overflow into the second channel (e.g., col. 3); and JP '934 teaches forming a deep well on a P-free buffer layer that also forms a well relative to the substrate. However, a search of the prior art failed to disclose or reasonably suggest such a

Art Unit: 2815

two-channel HEMT wherein the channels are sized such that only the lowest discrete energy level resides in the first well.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Onda 5,596,211 is the US counterpart to JP '898.
- b. English translation of JP '934.


### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to B. William Baumeister whose telephone number is (571) 272-1722. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2815

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



B. William Baumeister  
Primary Examiner  
Art Unit 2815

November 27, 2004

**BRADLEY BAUMEISTER**  
**PRIMARY EXAMINER**